

REMARKS/ARGUMENTS

Claims 1, 3-17, and 19-25 were previously pending in the application. Claims 1, 15, and 17 are amended and new claims 26-31 are added herein. Assuming the entry of this amendment, claims 1, 3-17, and 19-31 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

Claims 24 and 25 are allowed. In paragraph 3, the Examiner rejected claims 1, 3-5, 9, 13-14, 17, 19, and 22-23 under 35 U.S.C. § 103(a) as being unpatentable over Givehchi in view of Godfrey. In paragraph 4, the Examiner objected to claims 6-8, 10-12, 15-16, and 20-21 as being dependent upon a rejected base claim, but indicated that those claims would be allowable if rewritten in independent form. For the following reasons, the Applicant submits that all pending claims are allowable over the cited references.

Claims 1, 3-17, 19-23, and 26-31:

Independent claim 1 is amended to avoid unnecessarily limiting the claimed subject matter. In particular, currently amended claim 1 recites that “there is a DC offset between the first and second signals.” Support for this amendment can be found, e.g., in Fig. 3A (element 308) and Fig. 4. Independent claim 17 is similarly amended. These amendments are not made for the purpose of overcoming any prior-art rejections.

Claim 1 is directed to an apparatus for converting a non-return-to-zero (NRZ) data signal to a return-to-zero (RZ) data signal. The apparatus comprises an amplifier configured to generate an amplified RZ data signal corresponding to the NRZ data signal based on (i) the NRZ data signal and (ii) a clock signal synchronized with the NRZ data signal. The amplifier is a differential amplifier configured to generate the amplified RZ data signal based on a comparison between a first signal corresponding to the NRZ data signal and a second signal corresponding to the clock signal, wherein there is a DC offset between the first and second signals..

Givehchi discloses an optical apparatus for generating an RZ optical data stream using an NRZ data signal. A representative embodiment of this apparatus is shown in Givehchi’s Fig. 2. More specifically, the apparatus has Mach-Zehnder modulator 204 configured to receive drive signal 217 from driver 232, where the drive signal is generated based on output signal 236 of generator 240. Generator 240 includes AND-gate 241 configured to apply a logical AND function to the digital binary input clock and data signals, thereby generating signal 236. On page 2 of the office action the Examiner admitted that “Givehchi does not specifically disclose the second signal is a clock signal offset by a DC offset value.” However, the Examiner then proceeded to state that “Godfrey teaches a clock signal that is offset by a DC offset value (DC offset clock 1, fig. 2a).”

Godfrey discloses a phase-modulated optical-carrier data link for a focal plane array (FPA). In col. 3, lines 30-45, Godfrey explains that an FPA has a plurality of radiation detectors, each adapted to generate a voltage related to the radiation flux incident on that detector. The detector voltages are scanned out of the FPA in a time multiplexed manner to generate what Godfrey calls “DC offset signals corresponding to Clock 1, Clock 2 and Clock 3 at sample time i (T_i)” (col. 4, lines 40-42). These “DC offset signals” are then applied to modulator 32, which uses them to produce phase modulation of the light beam received from optical source 34 (see Godfrey’s Fig. 2a). The nature of Godfrey’s DC-offset clock signals is further illustrated, e.g., in his Figs. 3 and 6a-b. More specifically, a DC-offset clock signal comprises a sequence of rectangular pulses having amplitudes representing voltages scanned out of the

individual radiation detectors in the FPA (see, e.g., Fig. 3). Thus, the DC-offset clock signal of Godfrey has more than two signal levels and, as such, is not a digital binary signal. In addition, the term “DC offset,” as used in Godfrey, refers to the amplitudes of individual rectangular pulses, and not to the DC offset of the clock signal as whole.

First of all, the Applicant submits that the Examiner improperly combined the teachings of Givehchi and Godfrey. More specifically, the optical apparatus of Givehchi is designed to generate amplitude-modulated optical signals by converting an electrical NRZ data signal into an optical RZ signal, while the optical-carrier data link of Godfrey is designed to generate phase-modulated optical signals and is not related in any way to NRZ-to-RZ conversion. There is no suggestion in either reference that Givehchi’s digital binary clock signal can be replaced with Godfrey’s multilevel clock signal. In the absence of a suggestion, one skilled in the art would not be motivated to combine the teachings of Givehchi and Godfrey and to apply the “DC offset clock signal” of the optical-carrier data link of Godfrey, which has nothing to do with NRZ-to-RZ conversion, in the NRZ-to-RZ conversion scheme of Givehchi.

A modification and/or combination of reference teachings is improper unless the prior art suggests such a modification or combination. See, e.g., In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990) (the PTO erred in rejecting the claimed invention as an obvious combination of the teachings of two prior art references when the prior art provided no teaching, suggestion or incentive supporting the combination); Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 859 F.2d 878, 887, 8 USPQ2d 1468, 1475 (Fed. Cir. 1988) (a challenger to the validity of a patent “cannot pick and choose among the individual elements of assorted prior art references to create the claimed invention.”; the challenger “has the burden to show some teaching or suggestion in the references to support their use in the particular claimed combination.”); In re Mills, 916 F.2d 680, 682, 16 USPQ2d 1430, 1432 (Fed. Cir. 1990) (although a prior art device “may be capable of being modified to run the way [the patent applicant’s] apparatus is claimed, there must be a suggestion or motivation in the reference to do so.”); In re Laskowski, 871 F.2d 115, 117, 10 USPQ2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, “[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.”).

Second, even if the combination of Givehchi and Godfrey were proper, which the Applicant does not admit, the optical apparatus of Givehchi would simply not work with a DC-offset clock signal taught by Godfrey. More specifically, to correctly perform its intended logical “AND” function, AND-gate 241 in Givehchi requires two digital binary signals as its inputs. As already indicated above, a DC-offset clock signal of Godfrey is not a digital binary signal because its rectangular pulses have variable amplitudes depending on the radiation flux. Thus, if the digital binary clock signal applied to AND-gate 241 of Givehchi were replaced with a DC-offset clock signal of Godfrey, the AND-gate would fail to work properly and the functionality of the optical apparatus of Givehchi would be destroyed.

If a prior art reference is cited that requires some modification in order to meet the claimed invention or requires some modification in order to be properly combined with another reference and such a modification destroys the purpose or function of the invention disclosed in the reference, then a person of ordinary skill in the art would not have found a reason to make the claimed modification. See, e.g., In re Gordon, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984).

For all these reasons, the Applicant submits that claim 1 is allowable over the cited references. For similar reasons, the Applicant submits that claim 17 is also allowable over the cited references. Since claims 3-16, 19-23, and 26-31 depend variously from claims 1 and 17, it is further submitted that those claims are also allowable over the cited references. The Applicant submits therefore that the rejections of claims under § 103 have been overcome.

Claims 26 and 29:

Support for new claims 26 and 29 can be found, e.g., in previously pending claim 1 and Fig. 4. Each of new claims 26 and 29 specifies that there is a fixed DC offset between the first and second signals. As already indicated above, the DC-offset clock signal of Godfrey has a variable DC offset for each individual rectangular pulse. The Applicant submits that there is no teaching or suggestion in Godfrey that any one of his DC-offset clock signals has a fixed DC offset value. These facts provide additional reasons for the allowability of claims 26 and 29 over the cited references.

Claims 27 and 30:

Support for new claims 27 and 30 can be found, e.g., in Fig. 4. Each of new claims 27 and 30 specifies that the second signal has a substantially constant amplitude. The Applicant submits that the cited references do not teach or suggest a similar feature. More specifically, Givehchi does not teach DC-offset signals, while Godfrey's DC-offset clock signals have variable pulse amplitudes. These facts provide additional reasons for the allowability of claims 27 and 30 over the cited references.


Claims 28 and 31:

Support for new claims 28 and 31 can be found, e.g., in Fig. 4. Each of new claims 28 and 31 specifies that the second signal does not carry data. The Applicant submits that the cited references do not teach or suggest a similar feature. More specifically, Givehchi does not teach DC-offset signals, while Godfrey's DC-offset clock signals do carry FPA data represented by pulse amplitudes. These facts provide additional reasons for the allowability of claims 28 and 31 over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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